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RECORD OF GEOGRAPHICAL PROGRESS.

AMERICA.

LABRADOR.—It is expected that quite a large party of college students and naturalists will sail from New York City about June 16 for St. John's, N. F., whence they will embark upon another vessel for the northern Labrador coast, the purpose being to spend six weeks or so studying the zoölogy, geology, botany, archæology and anthropology of that region. It is one of the college excursions to interesting fields of study that, of late years, have been so successful. The expedition is organizing at the University of Pennsylvania, but a number of other institutions will take part in it. The field work will be directed by a number of specialists in these branches of science, and the purpose is to collect material and make as thorough a study as the limited time permits of the northern part of the Labrador coast. The party will be divided into four or five sections, each in charge of one or more professors, and the vessel will leave the sections at the mouths of inlets or rivers, up which they will travel, studying the plant and animal life. These inland trips will be made in boats and with adequate camp outfit. Dr. Frank Russell, archæologist, and curator of the University of Iowa, will give special attention to the study of the Labrador Eskimos, who have many curious traditions, legends and customs, and he hopes to make collections of their folk-lore and handiwork. In order to increase the fund for this enterprise, accommodations for a few laymen will be provided. The professors will give lectures daily on their various subjects, illustrated by the specimens procured, and thus the excursion will be made a valuable training school for young naturalists. The party will return to New York about Sept. 12. Mr. C. E. Hite, of Philadelphia, who has supplied this information, writes to us that the expedition of 1894 (*vide* Bulletin A. G. S., Vol. XXVII., No. 1, p. 63), of which he was a member, found the country full of life and presenting many unique features of much interest to naturalists. He adds: "So far as known, the species of animals and plants number: Invertebrate marine life, 337; insects and spiders, 113; fishes, 23, notably trout, salmon and cod in abundance; batrachia, 3; birds, 209, notably ducks, ptarmigan and other game birds; mammalia, 44, among which are herds of cariboo and reindeer, black bear and five species of seal, easily obtained and affording rare sport. The plants number 296 species, and the number will be much increased by further research. These shores have been visited by not more than half a dozen naturalists, and at long intervals apart. No systematic study has yet been made of the peninsula, geographically or otherwise, and so the field is comparatively virgin." Dr. A. S. Packard, in his book "The Labrador Coast," 1891, says that the Moravian missionaries have given us a much better idea of the intricacies of the extreme northern coast than the charts of the British Admiralty or the United States Coast and Geodetic Survey.

DISCOVERY IN CANADA.—The most recent Canadian explorations of importance are in the region south of Hudson Bay, which Dr. G. M. Dawson designated, in 1890, as "the unexplored region in Canada lying nearest to large centres of population." Between Hudson Bay and the water-parting between its drainage system and that of the St. Lawrence, is an area of 50,000 square miles (as large as New York State) which, up to two years ago, was very little known. In the eastern half of this region Dr. R. Bell, of the Canadian Geological Survey, visited, last summer, a river basin of considerable extent, whose timber and mineral resources give it prospective value. Current reports of the importance of this river system are undoubtedly exaggerated, and the official information is not yet at hand. Mr. Henry O'Sullivan, Inspector of Surveys for the Province of Quebec, made an important journey in the latter part of 1894 in the district just north of the headwaters of the Ottawa River, and west of Dr. Bell's field of labor on the west. An account of this journey appears in the "Report of the Commissioner of Crown Lands for the Province of Quebec," for the year ending June 30, 1895. He found the height of land separating the Ottawa basin from the Mekiskan basin, on the Hudson Bay slope, only three miles north of the northern end of Grand Lac Victoria, whose position he had determined in 1893 as 47° 48′ 25″ N. Lat., 77° 20′ 05″ W. Long. This point was 960 feet above the sea; the height of land is only 40 feet higher, and a portage only 600 feet in length separates the waters of the two basins. North of the water-parting he at once observed a striking difference in the character of the soil and timber. Lake Waswanipi, in 49° 40′ N. Lat. was the northern limit of his journey. The country he crossed, sloping very gently towards Hudson Bay, he describes as fertile land, well adapted for agriculture, with an abundance of merchantable timber, principally tamarack, which, on account of its enduring qualities in contact with the soil, is highly prized for fence posts and railway ties. In the Upper Ottawa valley the prevailing surface rocks are gneiss and granite, with a sandy soil, while north of the water-parting sedimentary rocks are the characteristic geological formations, and the soil, particularly in the lower levels, is fertile, but in the higher tracts there is considerable rough and scrubby country of little promise. Mr. O'Sullivan describes Lake Waswanipi as a fine sheet of water, 680 feet above sea level, "surrounded by a splendid looking country, level or gently rising in easy slopes, of the richest soil all around, timbered with large spruce, fir, tamarack, bouleau, poplar, etc." The most northern part of this lake is a little south of the latitude of Winnipeg, and Mr. O'Sullivan believes that the climate of the country he traversed compares favorably with that of Manitoba. At Lake Waswanipi, on September 20, he saw potato tops as green as in midsummer. He thinks several thousand square miles are well adapted for agriculture, and throughout his journey he found abundance of water, rivers and lakes, and numerous cascades that would supply motive power. He adds that it would be comparatively easy to build a railroad from any part of the province of Quebec into the heart of this region.

BIFURCATIONS IN SOUTH AMERICAN RIVERS.—Mr. Georg Hübner, who has been travelling for two years in the basins of the Orinoco and the Amazon, reports that the Casiquiare River which unites these two great river basins by a natural water channel is, by no means, the only instance of important river bifurcations in that region. The *Geographische Zeitschrift* (February, 1896) says that Mr. Hübner has found in Venezuela, and particularly in the territory of the Casiquiare, a number of these unions between rivers, and he believes that they will have an important influence upon trade in the future, as they will greatly facilitate communication by water. He adds that a gradually increasing portion of the waters of the Orinoco is reaching the Rio Negro and the Amazon through the Casiquiare, on account of the widening of the gap on the left bank of the Orinoco, which forms the connection between the two rivers. When M. Chaffanjon examined the bifurcation of the Casiquiare in 1888 he said that the place of junction of the two rivers was about 150 feet wide. He accounted for the bifurcation, which he thought had not existed for a long period of time, in this way: A short distance above the Casiquiare the Orinoco flows through a gorge only ninety yards wide. This contraction of the river bed greatly accelerates the current and just below the gorge the rapid stream gradually undermined the left bank, cutting a channel toward the head-waters of the Casiquiare, of the Amazon system. The water parting there is quite near the Orinoco. Finally, in some period of flood, a little of the Orinoco's overflow reached the Casiquiare, and the excavation of a channel was thus begun, the channel being deepened in subsequent rainy seasons, until the union between the two rivers was complete.

PHYSIOGRAPHIC MATERIALS.—At the third annual exhibit of the New York Academy of Sciences, on March 26, there was, for the first time, a showing of physiographic materials. The exhibit was a small one, and was under the charge of Richard E. Dodge, of the Teachers' College. It included a collection of recent text and scientific books and a set of maps and models illustrating certain chosen topics from the principles of physiography. The aim was to show the best sources to obtain the details of the science as well as the material that could be readily used to illustrate the principles, both to children and to those of more mature years.

The models exhibited were of two classes. One series was to illustrate a theoretical cycle of land development upon constructional forms of various origins. In this case no one place was taken as a type locality. A definite set of conditions was assumed and the changes in form consequent upon the conditions were illustrated. Each land type was shown in its youthful, mature and senile condition. The second set of models was of actual localities in this country, modelled with a small vertical exaggeration, and illustrated particular cases in which examples of rivers, drainage, form, etc., could be found that corresponded with the theoretical cases shown in the first class.

The first set of models was loaned by the maker, Prof. W. M. Davis, of Harvard, who uses them in his teaching. The second set was also loaned by the maker, Mr. E. E. Howell, of Washington, D. C.

The remainder of the exhibit consisted of selected maps showing the relation of topographic form and geologic structure, to illustrate means of representation of form and the importance of a knowledge of physiography in studying the features and conditions of a land. New Jersey was the special base best illustrated. The other maps shown were to illustrate types of shore lines from along the Atlantic and Gulf coast. These maps were the sailing charts of the Coast Survey, and gave examples of the various practical uses that could be made of these maps by the student of land forms and their development.

It was not intended to show all that had been done in the last year in this branch of science, which is advancing so rapidly. It was rather intended to offer suggestive materials that would serve to illustrate, in a striking way, the range of possible studies in the science and the paths along which investigation and application of principles are advancing.

Inasmuch as a proper understanding of physiographic principles and processes is the best basis for the study of political geography and history, it was intended to show in this small way some of the lines of dependence of man, in his development, upon the physiographic features. Another year it is hoped to make the exhibit more inclusive and to show the direct application of principles to other branches of learning.

EUROPE.

EROSION ON THE COASTS OF ENGLAND.—The sea continues to make disastrous inroads along the Eastern and Southern coasts of England, and particularly along the chalk cliffs of Kent, where the English Channel narrows. Correspondents of the London *Standard* take the extremely gloomy view that unless something is done to stop the waste, the entire County of Kent and large parts of the South and East coasts will disappear entirely from the map of England. The sea, driven by tides and winds, dashes against the lower part of the cliffs, softens the porous rock, and digs into it deeper and deeper until the mass above, deprived of its support, breaks off, falls over on the narrow beach, and is washed away by the currents. Engineers seem to have little faith in sea-walls or embankments for protection, they being regarded as only temporary, no matter how costly they are. The efficacy of a wide beach of shingle or sand is affirmed, and the correspondents protest against the practice of removing shingle, stones and even large boulders, which are taken away in boats or schooners and sold, thus robbing the shore of a source of natural protection.

ASIA.

DISTRIBUTION OF ARMENIANS IN ASIATIC TURKEY AND TRANSCAUCASIA.—*Petermanns Mitteilungen* for January, 1896, contains an article on the distribution and number of Armenians in the larger part of their native home, comprised in Asiatic Turkey and Transcaucasia (Russian), illustrated by a map compiled by Dr. Supan. The facts given show that the Armenians form a far smaller element in the population of the recently disturbed districts than has been generally supposed. Nearly two-thirds of the Armenians living in Asiatic Turkey are found in Armenia and Kurdistan, and in the five Vilayets comprising these territories the percentage of the total population which they contribute is: Erzerum, 20.2 per cent.; Van, 18.6; Diarbekir, 16.8; Bitlis, 33; Mamuret-el-Aziz, 12.1. The total Armenian population of these five Vilayets is 478,701, which is not quite one-fourth of the total population, the Mohammedans being nearly three times as numerous, while Jews, Greeks and other Christians contribute a small element. The statistics deal also with the Vilayets of Sivas, Trebizond, Adana and Angora in Asia Minor and Aleppo in Syria, and including them in the general calculation, it appears that in the ten Vilayets of Asiatic Turkey where the Armenians are in any considerable numbers they form only about one-sixth of the population, the Mohammedans being twenty-five times as numerous, while the Nestorians and other Christians are about one-tenth of the population. In Transcaucasia, however, the Armenians who live there in peace and security, while their kindred south and southwest of them are now plunged in the deepest misery, form 36.3 per cent. of the population.

MR. MUMMERY'S DEATH IN THE HIMALAYAS.—Mr. A. F. Mummery, famous as an Alpine climber, lost his life in August last in the Himalayas while attempting to reach the summit of Nanga Parbat (26,630 feet), whose northern flank is washed by the Indus about ten miles away from the central mountain mass. His two Gurkha companions perished with him. He had reached a height of about 20,000 feet on the south side of the mountain. The climbing was most severe, and the last 5,000 feet required two days and a night. Then the Gurkha with him was taken ill and he was compelled to retreat to his camp, 11,000 feet below. Later he tried the northern side of the mountain, he and two Gurkhas ascending a long glacier pass that seemed to offer a promising route. He was last seen on August 24 going up a side glacier tributary to the main ice stream on which he had started. The subsequent search made it evident that all three had been buried under a snow avalanche. The pass where they disappeared from view was a narrow valley walled in by steep slopes covered with snow and ice. As Mr. W. M. Conway showed, in the story of his climbing in the Himalayas, avalanches are the greatest danger that explorers meet among these mountains.

SOURCES OF THE IRAWADI.—Prince Henry of Orleans, one of the new Gold Medallists of the Paris Geographical Society, completed at Sadiya on the Brahmaputra River, on last Christmas, probably the most noteworthy journey of exploration in 1895. He started from Ha-noi, capital of Tonkin, on January 26, last year, accompanied by Lieutenant Roux, M. Breffaut, a Tonkin colonist, and twenty-seven baggage animals, his purpose being first to attain Tali-fu in Yunnan, avoiding main routes and the paths of explorers and giving particular attention to the upper Mekong River in its course through Western China. He found the basin of the Mekong in China, above 24° 40′ N. lat., to be so narrow that it may be crossed in a few hours. From Tali-fu he took the shortest route to India, across a mountainous country that is not practicable for trade. It led him through the region of the Upper Mekong, Salwin and Irawadi rivers, in about 28° N. lat., hitherto supposed to be inaccessible on account of hostile natives, though the Prince, with his two white comrades and his baggage-men, had no trouble. This good fortune enabled him, he says, to finally settle the long-vexed question of the source of the Irawadi. An extract from his letter to the Paris Geographical Society, printed in the London *Times* on February 7, says: "The three branches forming the Irawadi, are, reckoning from the west, the Kiu-Kiang, the Telo and the Namkiu. The first two are the deepest and widest. They are not marked on the maps. The most northerly branch, the Kiu-Kiang, does not rise higher north than 28° 30′ N. lat." He crossed all three branches. He also affirms the inaccuracy of the late Gen. J. T. Walker's map of South Eastern Tibet (Proceedings of the Royal Geographical Society, June, 1887,) and of his map of Tibet, published by the Royal Geographical Society in 1894, in which the Salwin River is indicated as rising near Tchamonlong, south of 28° N. lat. The Prince says he has evidence that the Ur Chu (also Nag Chu or Lu), rising far north and west near Tengri Nor in inner Tibet is the upper course of the Salwin. Only a small part of the course of the Ur Chu has yet been surveyed, but it has, for some years, been indicated in a number of the best atlases as the probable upper course of the Salwin. The mountains among which the Mekong and the Irawadi rise and through which the Salwin and the Brahmaputra flow have long kept the secret of more hydrographic problems than were found in any other small part of the earth. The barbarous Mishmi and other tribes barred the way to explorers Wilcox (1826), Griffith (1836), Abbé Krick (1851–53), and the travels of Pandit Krishna, Macgregor, Needham and others gave food for geographical controversy if they did not settle vexed questions. It is now known that the Sangpo of Tibet is the upper course of the Brahmaputra and not of the Irawadi, as Mr. Robert Gordon, supported by old Chinese geographers, ingeniously contended (*Proceedings* of the Royal Geographical Society, May, 1885), and that the Ur Chu or Lu of Tibet is the Salwin and not the Irawadi.

NEW ATTEMPTS TO REACH LHASA.—*Petermanns Mitteilungen*, No. 8, 1895, says that Dr. P. Moewis has assumed the habit of a Lama at Darjiling and has professed his conversion to Buddhism as preliminary to an advance upon Lhasa, which he hopes by this means to reach. Mr. and Mrs. St. George Littledale have returned to England after spending a year in a vain attempt to reach Lhasa. They penetrated to within forty or fifty miles of the holy city. Starting from Constantinople in November, 1894, they reached Samarkand by the Trans-Caspian Railway and then followed the usual caravan route to Osh, Kashgar and Khotan, buying transport animals by the way. When they set out from Khotan they had 250 transport beasts to carry their food and fodder and the large collections they had already made. A large number of their horses died for lack of food while crossing the desert to Cherchend and Tibet, and the party, numbering thirteen in all, were compelled to abandon their zoölogical collections, books, instruments and, in fact, everything that was not necessary for life. After reaching Tibet the greatest pains were taken to escape observation, the intention being, if possible, to get to Lhasa without being seen by the people. They made long detours to avoid shepherds or nomads whom they saw in the distance, and often they marched at night and camped during the day. Mr. Littledale says, in an interview published in the London *Times*:

> "In spite of the hardships we had to endure, all went well until the beginning of July, when we were within 200 miles of Lhasa. Suddenly we rode into a Tibetan encampment in a narrow pass. We saw the Tibetan shepherds and their flocks in the valley long before we came upon them; but, as a detour was impossible, there was nothing for it but to go through them. Presently two officials came out and told us to stop, which we refused to do, and rode through the encampment as hard as possible. We were not attacked, but we knew that messengers had been despatched to warn the people of our approach, so we rode as hard as we could in order to keep ahead of them. After a week's hard riding we reached Tengri Nor, and here 200 horsemen, armed with spears and matchlocks, were assembled. One man came up and seized my bridle, but, on my pulling out my revolver, he let go. Shortly after this the force disappeared, and presently occupied both sides of a narrow valley through which we had to pass. The situation was threatening, but we had no fighting. With loaded weapons we rode through the Tibetans, pushed on over a very

high pass and finally got to within forty or fifty miles of Lhasa. There we were met by an army of 500 men and some Lamas, who told us to go back. We refused, and stayed for a month arguing with the people. Almost every day the Dalai Lama—the spiritual ruler of Tibet—sent us a message telling us to go back. At this time Mrs. Littledale fell very ill, and we had to make terms for retiring. The people wanted us to go back the way we came, but this was, of course, out of the question. We told them that we would fight our way through in the direction of Sikkim. Seeing we were in earnest, the Tibetans finally allowed us to go via Ladak, which place we reached in November last."

AFRICA.

THE LAKE REGION NEAR TIMBUKTU.—Since the French forces took possession of Timbuktu several members of the military staff have added some interesting facts to our knowledge of the surrounding region. A map published in the *Comptes Rendus* of the Paris Geographical Society (1894, Nos. 18, 19), compiled by Lieutenant Bluzet, gave the first definite information about the lacustrine region that had been discovered west of the Niger and southwest of Timbuktu. The same publication (1895, p. 62), added some details regarding the vast unexplored region in the desert, north and north-east of Timbuktu and east of Dr. Lenz's route. He found no water between Arauan in the desert, and Timbuktu, but a little east there are wells at In Alahi and Bu Jebiba. The latter is a clay-built town and this route is preferable to that followed by Lenz. A summary of the results of the French researches in the region around Timbuktu is presented in the *Bulletin* of the same society, (1895, part 3) by Lieutenant Bluzet, illustrated by a map on a scale of 1:500,000 (approximately thirty-two statute miles to an inch). The paper and map give some idea of this new-found lake region, still partly unexplored, which lies south and east of Lenz's route. Debo, the most southern of these lakes, into which the Niger pours in two channels, is described as a fine deep lake whose blue waters wash a clean sandy beach on the east. North of this lake the whole country on both sides of the river is inundated for half the year and when the waters subside they leave behind, in depressions of considerable depth, a series of lakes connected with the river by channels nearly choked with vegetation. The basins of these lakes, which extend north to the desert, are separated by water-partings of a mean elevation of about 330 feet. Ten of these lakes are known to exist, but they have not all been visited and there may be others. The largest and most northern of them is Faguibine, which is sixty-eight miles long and attains a depth of more than 100 feet. Mountains bound it on the north and east.

Storms are frequent and violent and numerous islands in the lake are very convenient places of refuge when the waves threaten to engulf small craft. Lake Tele is connected with Faguibine on the south by a narrow channel and the Gundam Channel connects Tele with the Niger, flowing to the river in the dry season and from it in the period of inundation; "we must admire," says Lieutenant Bluzet, "the discretion and skill of the guides who escorted Dr. Lenz within a few hundred metres of the lake [Faguibine] without letting him see it; and neither Barth nor anyone else heard of it."

THE POLAR REGIONS.

DR. NANSEN AND THE NORTH POLE.—The fullest statement with regard to the origin of the report from Siberia, in February last, to the effect that Dr. Nansen had discovered the North Pole and was on his way home, was telegraphed from Irkutsk to St. Petersburg, on March 3, by the governor of Irkutsk, who reported that he had received the following from Yakutsk on the lower Lena River:

"Peter Ivanovitch Kuchnareff, who trades at Ustyansk [near the Arctic coast, and the trading point on the mainland which is nearest to the New Siberian Islands] by a letter dated November 10, communicated the following to the merchant Kuchnareff at Yakutsk:—'We learn that Dr. Nansen's expedition has reached the North Pole, has discovered a hitherto unknown land, and has now returned. Consequently the Arctic Ocean has now been explored.' No confirmation of the above has been received from other sources. In order to verify the news and, in case of necessity, to render assistance to the expedition, the governor of Yakutsk has instructed a member of the administration in the Verkhoyansk District to proceed to Ustyansk."

No report has come that Nansen or any of his men had been seen, and while there was some tendency in Europe to give credence to the earliest version of this story, the fact that no confirmation has since been received, and that the story was discredited by the leading Russian authorities, including the Governor-General of Eastern Siberia and the Secretary of the Russian Geographical Society, have practically destroyed all faith in its possible accuracy. From the first all American geographers were entirely skeptical.

THE SO-CALLED JEANNETTE RELICS.—In a letter to the New York *Sun*, printed on February 22, Dr. W. H. Dall gives reasons for believing that the loose papers, biscuit boxes, oil-skin trousers and other articles picked up on an ice floe near to the coast of southwest Greenland in the summer of 1884, were not, as had been affirmed, relics of the Jeannette party which had drifted across the Polar area from north of the New Siberian Islands, but had been set afloat by the crew of one of the Greely relief vessels of that year, in the belief that another ship of the fleet might pick them up and be mystified by the find. The fact that Dr. Dall and other American authorities believe they have ample evidence to wholly discredit the so-called relics should be recorded, inasmuch as geographical periodicals generally have accepted them, for years, as genuine, and are still republishing the story in connection with the rumors about Dr. Nansen. Dr. Dall says that he stated the facts in letters to Dr. Rink and Baron Nordenskiöld and he adds:

"Shortly before Dr. Nansen's expedition started, some friend of his, whose name has escaped me, wrote to me on Nansen's behalf in regard to these relics, and the facts as I understood them, were furnished, so that, before he sailed, though after he had written of the relics as genuine, Nansen was informed of their doubtful or fraudulent character, at least if my letter to his friend was passed on to him. No doubt of the perfect good faith of the Danes or of Nansen can be held for a moment, but that the latter may have retained his faith in the Arctic currents of which he (as I believe mistakenly) wrote, is altogether probable."

Prof. George Davidson, President of the Geographical Society of the Pacific, writes that the Society has appointed Sir Henry Lund and himself a Committee to report upon the Jeannette relics. Sir Henry represented the Society at Copenhagen two or three years ago and there learned by personal conference the story of the relics. There was then no doubt of their genuineness and the Society means to urge the investigation.

EKROLL'S WINTER IN SPITZBERGEN.—Some years ago, Martin Ekroll announced his desire, as soon as he could secure funds for the purpose, to use some point in Spitzbergen as a base for a sledge journey over the ice-covered sea, to the North Pole. He spent the winter of 1894–95 in Spitzbergen for the particular purpose of studying the ice conditions, and he has returned to Norway convinced that the chances of reaching the Pole by sledge from Spitzbergen are exceedingly remote. In the summer of 1894, the waters along the eastern shores of the archipelago, usually choked with ice, were quite open, so that Ekroll's vessel was able to reach the east coast of North East Land, where he wintered, the vessel being frozen in the ice from October 17, 1894, to July of last year.

Many bears were seen and sixty-three were killed. Mr. Ekroll believes that the formation of glaciers, especially in East Spitzbergen, is on the decline.

MR. ANDREE'S COMING BALLOON EXPEDITION.—Mr. Andree, who will attempt to cross the North Polar area in a balloon, expects to complete the airship in April, to start, early in May, for the northwest coast of Spitzbergen, and to be all ready there, if a favorable wind occurs, to begin his venturesome journey by May 25. The cloth of which his balloon is making is said to combine lightness with a greater degree of strength of texture than has been attained in balloon-making, heretofore, and the seams are still stronger than the cloth. A balloon house is building in Norway to be taken in sections to Spitzbergen and there erected. This octagonal house will be about 80 feet high and 110 feet broad. It will be covered by a roof of balloon cloth, and in this structure, the balloon will be inflated and confined until the ascent is made. The floor and inside walls of the house will be covered with felt to prevent damage to the balloon by friction. Thirty-five tons of sulphuric acid and malleable iron shavings will be taken to Spitzbergen for the manufacture of the inflating gas. Letters have been despatched to all the Hudson Bay posts in Northern Canada, to spread intelligence of the enterprise among the Indians and Eskimos so that they may not regard the balloon as a dangerous apparition, but may be disposed to give the explorer assistance if necessary. The same information is being spread over Northern Siberia. Mr. Andree succeeded in arousing so much interest in his project in Scandinavia that ample funds were provided for his needs. While Arctic authorities by no means approve of his scheme, they will await its outcome with much interest. Mr. Andree is a very accomplished aeronaut and he deserves success, even though so perilous a mission cannot be encouraged as a practical method of extending geographical knowledge. At all events he has won respect by his careful and cautious preparations, availing himself, as he has done, of every aid that science affords. He has a record of nearly every cache of provisions that has been left in Arctic regions which may, possibly, be of use to him if he is stranded in those parts. His balloon will carry two or three persons, a sledge, sailing boat, several guns, a camera, ballast and provisions for four months. Mr. Andree believes it will be sufficiently gas tight to hover in the air for thirty days at a height of about 800 feet. At starting he desires a south or nearly south wind in order to get into the central Polar basin over a considerable part of which, if he has good fortune, he may drift, driven by variable winds. Dr. Ekholm the well-known meteorologist, who had charge of the Swedish station in Spitzbergen in 1882–83, will accompany him.

The Geographical Society of the Pacific, in compliance with a request made by the Minister of Sweden and Norway at Washington, early in March appointed President Davidson and Sir Henry Lund, the Swedish Consul at San Francisco, a Committee to take measures for spreading through Alaska and the coasts and islands of the Arctic the information which shall prepare the inhabitants to receive and to aid the explorer Andree, in the event of his descending among them during the summer from his daring balloon voyage to the Pole. A number of notices for distribution among the natives of Northern Alaska, British Columbia and Siberia, were sent by the steam whaler *Orca*, which left San Francisco for the Arctic on the 17th of March.

The Alaska Commercial Company, the Pacific Steam Whaling Company and other organizations have responded favorably to the appeal made in the following letter:

GEOGRAPHICAL SOCIETY OF THE PACIFIC.

SAN FRANCISCO, March 16, 1896.

Captain Josiah N. Knowles, President of the Pacific Steam Whaling Company—Dear Sir: The Geographical Society of the Pacific has been officially informed that Professor Andree will complete the outfit of his balloon expedition to the North Pole so as to start from Spitzbergen in the month of July. This attempt to reach the North Pole is favorably supported by the Swedish Government and by scientific men in Europe who have investigated his appliances and methods.

Of course no one can predict where this balloon may come down in the circumpolar regions, and the Swedish Government is desirous that information shall be sent to that region whenever it is practicable by all such parties as are in or going to the North. Therefore the Geographical Society of the Pacific proposes to exert its influence in urging all parties from California, Oregon, Washington and British Columbia to make known to the inhabitants of those parts of Alaska, British Columbia and Siberia bordering upon the Arctic Ocean, the possibility of the balloon reaching their country and asking them to give the balloonists support and assistance and help and direct them to the nearest white settlements, and if the balloon should be seen from any place, that the natives will report the same to the nearest white settlement.

The Geographical Society of the Pacific therefore urges the Pacific Steam Whaling Company to instruct their captains to circulate this information about the balloon to all natives and persons within their reach in the Arctic regions.

By order of the Council,
GEORGE DAVIDSON,
HENRY LUND,
Committee.

The German South Polar Expedition.—The German Commission for South Polar Exploration issued a memorial in December, outlining its scheme for a German Expedition. The Commission advises that the proposed expedition shall enter the Antarctic regions from the Indian Ocean along the meridian of Kerguelen Island, which is between the widely separated routes of Cook (1773) and Nares (1874), offering a wholly untried route into the unknown area and which, on that account, may result in interesting discoveries. To carry out the desired investigations in meteorology, terrestrial magnetism, geodesy and other branches of science, it is important to spend a Winter upon an island or upon the coast of the supposed Antarctic continent. It is desirable that two vessels shall be at the disposition of the party, one to remain at the headquarters of the expedition for whatever service the explorers there may require, while the other ship engages in geographical and hydrographical investigations. These vessels should be specially built for Polar navigation, and of about 400 tons burden (nearly three times the tonnage of the Germania of the German North Polar Expedition of 1869–70). Each ship should carry thirty men, including on each vessel four officers and four scientific specialists, from among whom the observers at the station should be selected. The total cost of the expedition is provisionally estimated at $225,000, a considerable part of which has already been pledged by private citizens who are interested in Antarctic exploration. Subscriptions towards completing the fund are invited. The financial participation by the government in the enterprise will depend upon the interest shown by the amount of public subscriptions. The President of the German Commission is Professor Dr. Neumayer of Hamburg, the well-known meteorologist and, for years past, one of the foremost advocates of the great importance to science of the renewal of Antarctic research.

No American Antarctic Expedition Yet.—The report has been widely printed in Europe and copied into some American journals that an expedition consisting of two vessels, left this country last fall, to engage in exploration in the South Polar area. The report is entirely incorrect, as no American expedition has sailed for Antarctic waters; nor are we aware that there is any immediate prospect of the launching of such an enterprise here.

THE OCEANS.

The Deepest Soundings Yet Made.—It was announced in the *Bulletin* (No. 4, 1895), that Commander A. F. Balfour on H. M. S.

Penguin had discovered a deeper spot in the ocean than any yet known. His observation, however, was not complete, as his wire broke when he had run out 4,900 fathoms without having reached bottom. This was in the Pacific Ocean, in 23° 40′ S. Lat., 175° 10′ W. Long., over 200 miles south of the Island of Tongatabu, the largest island of the Tonga or Friendly group, and in the neighborhood of the usual steamship route between San Francisco and Australia. Later, he resumed his sounding with much success, as is described in *Nature* of February 27, obtaining three casts that are deeper than any previously made. Returning from Tongatabu to the spot where he had failed to reach bottom with 4,900 fathoms of wire, he found it at 4,940 fathoms, and a little northeast of this spot he reached bottom at 5,022 fathoms. A little further east he found the bottom shallowing, and obtained a sounding at 3,100 fathoms. Then turning southwest over a bank where his wire measured depths between 2,200 and 4,400 fathoms, he struck another great depression of 5,147 fathoms, about 100 miles E. N. E. of Sunday Island, in the Kermadec group, and 100 miles east of MacCarthy Island he secured the deepest sounding yet made, 5,155 fathoms, which is 600 fathoms or 3,000 feet deeper than the sounding by the U. S. S. *Tuscarora* near Japan in 1874. It is interesting to observe that these three soundings of over 5,000 fathoms were not obtained in the same hollow, but are separated by areas of much less depth. The two extreme soundings were 450 miles apart. On two occasions the usual abysmal red clay was brought up by the sounding tube and a microscopic examination of the specimen from 5,147 fathoms shows that the remains of siliceous organisms are almost, if not entirely absent. The discovery of these greatest known ocean depths near the sub-marine plateaus on which rest the island groups of Tonga and Kermadec, gives further confirmation of the fact already observed, that "as a rule, the deepest water is found not in the central parts of the great oceans, but near or approximately near the land, whether of continental mass or island isolation."

A REMARKABLE VOLCANIC ISLAND.—The *Geographical Journal* for January, 1896, prints an account by Lieut. Boyle T. Somerville, H. M. S. *Penguin*, of a visit to the small island of Niuafóu, which is quite isolated in the Pacific, about midway between the Fiji and Samoa groups. This island is the upper portion of a volcano reared from the sea floor by the accumulation of ejecta, and the remarkable feature about it is that an eruption blew out the interior, leaving merely a ring around a central cavity. This ring, which is about 3½ by 3 miles in diameter, has an average height of 350 feet above the sea, and is covered with vegetation, except in one place, where a recent lava stream has not yet received its coating of green. The ring is nowhere more than a mile in width, and parts of it are much narrower. The whole of the interior area, about 3 square miles, is occupied by a picturesque, nearly circular lake, roughly 2 miles in diameter, containing three green islands. Round its circumference drops a sheer precipice, 200 to 300 feet in depth, whose sides are covered with the luxuriant foliage and huge creepers of the tropics, from which, here and there, buttresses of rock jut out that, ages ago, must have overlooked the huge crater basin of fire beneath, now covered by the peaceful lake. Lieut. Somerville and his party descended to the lake whose surface was found, by aneroid, to be 95 feet above the sea level. The water is slightly alkaline, but the horses on the island drink it. The lake is called "Vai Lahi" (Great Water), contains no fish and is said to be very deep, though the tradition of a sounding of 100 fathoms with no bottom requires confirmation. Moti Moli Moli, the second in size of the three islands, is said to have a small crater of its own containing fresh water, a lake within a lake. An oddly shaped peninsula with a bare, reddish surface jutting into the lake from its east side, was lifted above the water in 1886, by an eruption, and clouds of dust and sand were being driven by the wind into the lake. This mass was upheaved from the lake bottom. The natives have begun to plant cocoanuts on the lower parts of it. Besides an abundance of wild ducks, there is another bird which is said to be found alone on Niuafóu. It is called "Malau," and apparently belongs to the family of Megapodes (birds with large feet, of which the jungle bird of Australia is a typical example). It buries its eggs for hatching in the soft, hot sand. It is the size of an ordinary fowl, russet-brown in color, shaped like a guinea fowl, with small head and strong, pink legs and feet. About 1,000 Tongans live in nine villages on the sea edge of this narrow crater rim. They are all Christians. One French priest, two English traders and a German form the white population. The disintegrated lava makes a deep rich soil, and cocoanuts, bananas, taro and other tropical food plants are raised in abundance. Copra is exported. The island is the northern limit of the Tongan dominions, and has a native Tongan governor. The anchorage is poor, but a landing may be made without much difficulty when the tide and wind are favorable.